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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

27 October 2004

Commander, Atlantic Division
Naval Facilities Engineering Command
Environmental Quality Division, Code: 1823
1510 Gilbert Street
Norfolk, Virginia 23511-2699
Attn.: Ms. Dawn Hayes

Re: *Remedial Investigation/Human Health Risk Assessment and Ecological Risk Assessment for SWMU 3, Pier 10 Sandblast Yard*
Naval Amphibious Base (NAB) Little Creek
Virginia Beach, VA

Dear Ms. Hayes:

The above referenced document has been reviewed by the Environmental Protection Agency. The following ecological, hydrogeological and toxicological comments are offered.

Ecological

1. There are a number of places in this document where the terms risk and screening values are used without specificity to either human health or ecological risk. In all cases, the document needs to clearly indicate which receptor (humans or ecological) these terms like risk and screening values apply.

2. On page 2-6, the text indicates the potential risks to upper trophic level ecological receptors were considered low, as only iron and zinc exceeded a LOAEL based screening value for piscivorus birds. The text should clear explain why the risk is characterized as low. The facts presented do not support this characterization.

3. On page 8-20, the text indicates mean concentrations are also appropriate for evaluating potential risks to populations of lower trophic level receptors. The use of central tendency estimates is a valid approach to help characterize risk. It cannot be solely used to eliminate contaminants from further consideration. Reasonable maximum exposure concentrations (and doses) must be considered as well.

4. Section 8.6.1, Recommendations, on page 8-31 states that the presence of sandblast grit residues in terrestrial areas is a potential continuing source of contaminants to Little Creek Harbor, and it is recommended that these residues be removed to eliminate this

transport pathway. BTAG concurs with this recommendation. The document does not clearly establish that metal contamination in soil is solely associated with the ABM residue. The document should clearly indicate if other areas of metal contamination in soil are present that are not associated with the presence of sandblast grit residue. BTAG also supports the recommendation that the ecological risk assessment for sediment at the site proceed to Step 4 to better quantify the potential risk.

Hydrogeological

1. EPA concurs with the recommendation that additional sampling and delineation of the groundwater contamination at SWMU 3. An assessment of potential sources must be performed.

Toxicological

1. PAGE V - In addition to soil, surface water and sediment, groundwater was also sampled at SWMU 3 during the Remedial Investigation. This point should be noted in the Executive Summary of the report.

2. PAGE IX - When target organs are considered, only a marginal non-cancer risk is associated with exposure to soil by future residential children. For these receptors, the soil Hazard Index (HI) for the gastrointestinal tract is 1.1, due to the cumulative effects of beryllium (HI = 0.11), copper (HI = 0.35) and iron (HI = 0.67). Since the greatest contributor to the soil HI is iron, and since the provisional RfD for this metal is not currently supported by EPA - NCEA, this pathway does not constitute a direct contact threat at the site. The text and tables throughout the report should be revised to reflect this.

   Thallium is listed as a Contaminant of Potential Concern (CoPC) in groundwater. However, this compound is often an artifact of the method employed for sample analysis. A chemist should be consulted to determine if the thallium detections at this site are reliable, and the report should be modified, as necessary.

3. PAGE 7-3 - For TCE, the Carcinogenic Slope Factors (CSFs) presented in the draft TCE Health Risk Assessment (U.S. EPA, August 2001) -- that is, 4E-01 (mg/kg/d)-1 to 2E-02 (mg/kg/d)-1 -- should be used to estimate potential risks related to this compound. Text and tables in the report should be revised accordingly.

4. PAGE 9-4 - With up to 21 ug/L in the Upper Aquifer, the excess cancer risk to future residential receptors from vinyl chloride in groundwater is 1.7E-04. This compound should be identified as a risk driver in Section 9.5.2. (Note that the MCL for vinyl chloride is 2 ug/L.)

   Arsenic was detected in groundwater at the site at up to 25 ug/L, with a 95th percent UCL concentration of 13 ug/L. However, Section 9.5.2 indicates that arsenic does not appear to be site-related because measured concentrations are similar to background conditions. As stated during previous reviews of sites at this facility, EPA is not convinced that background estimates for arsenic in groundwater are truly representative. It is our opinion that arsenic in groundwater at SWMU 3 should not be ignored based simply on a

comparison to background. (Note that the MCL for arsenic is 10 ug/L.)

As an aside, Table 2-5 in Appendix H summarizes analytical data from the investigation. This table also has a column for background concentrations of chemicals; however, background values are not provided. There's probably a good reason for this, but EPA just want to make sure that this was not an inadvertent omission.

5. APPENDIX H, TABLE 3.1 RME - The Integrated Uptake Biokinetic (IEUBK) Model requires use of an *arithmetic mean* soil lead concentration to estimate blood-lead (PbB) levels in residential children. However, this table indicates that for surface soil, the transformed mean (133 mg/kg), rather than the arithmetic mean (426 mg/kg), was used to represent an Exposure Point Concentration (EPC). This should be corrected, and the IEUBK Model should be run, as appropriate. (Note that the arithmetic mean is an unbiased estimator of the mean of a population, regardless of the underlying distribution of that population.)

6. APPENDIX H, TABLE 3.2 RME - The IEUBK Model requires use of an *arithmetic mean* soil lead concentration to estimate PbB levels in residential children. However, this table indicates that for total soil, the transformed mean (19 mg/kg), rather than the arithmetic mean (181 mg/kg), was used to represent an EPC. This should be corrected, although conclusions for lead in total soil will not be impacted.

7. APPENDIX H, TABLE 3.3 RME - The IEUBK Model requires use of an *arithmetic mean* soil lead concentration to estimate PbB levels in residential children. However, this table indicates that for surface sediment, the transformed mean (230 mg/kg), rather than the arithmetic mean (436 mg/kg), was used to represent an EPC. This should be corrected in the table, although this point is moot since the IEUBK Model is not designed to evaluate adverse impacts associated with lead in sediment.

8. APPENDIX H, TABLE 3.4 RME - The IEUBK Model requires use of an *arithmetic mean* soil lead concentration to estimate PbB levels in residential children. However, this table indicates that for total sediment, the transformed mean (96 mg/kg), rather than the arithmetic mean (269 mg/kg), was used to represent an EPC. This should be corrected in the table, although this point is moot since the IEUBK Model is not designed to evaluate adverse impacts associated with lead in sediment.

9. APPENDIX H, TABLE 3.1 - 3.7 CT - EPCs in these tables sometimes represent the arithmetic mean, the transformed mean, the 95th percent UCL, or the maximum. This apparent lack of consistency in CT EPCs should be reviewed for accuracy.

10. APPENDIX H, TABLE 3.1 CT - The arithmetic mean for lead in surface soil is given to be 133 mg/kg. The transformed mean is also given to be 133 mg/kg. Please check this calculation for accuracy.

    As noted in previous comments, the arithmetic mean for lead in soil should be used as the EPC.

11. APPENDIX H, TABLE 3.2 CT - The arithmetic mean for lead in total soil is 181 mg/kg. The transformed 95th percent UCL is 19.1 mg/kg. This latter value was used to represent

the EPC. As noted in previous comments, the arithmetic mean should be the EPC for lead in soil.

12. APPENDIX H, TABLE 3.3 CT - The IEUBK Model requires use of an *arithmetic mean* soil lead concentration to estimate PbB levels in residential children. However, this table indicates that for surface sediment, the transformed mean (30 mg/kg), rather than the arithmetic mean (436 mg/kg), was used to represent an EPC. This should be corrected in the table, although this point is moot since the IEUBK Model is not designed to evaluate adverse impacts associated with lead in sediment.

13. APPENDIX H, TABLE 3.4 CT - The IEUBK Model requires use of an *arithmetic mean* soil lead concentration to estimate PbB levels in residential children. However, this table indicates that for total sediment, the transformed mean (96 mg/kg), rather than the arithmetic mean (269 mg/kg), was used to represent an EPC. This should be corrected in the table, although this point is moot since the IEUBK Model is not designed to evaluate adverse impacts associated with lead in sediment.

14. APPENDIX H, TABLE 3.6 CT - For 1,2-dichloroethane and chloroform, the EPCs (1.8 ug/L and 0.67 ug/L, respectively) are greater than the maximum detected concentrations (1.5 ug/L and 0.64 ug/L, respectively).

15. APPENDIX H, TABLE 3.7 RME - This table is mislabeled. It should read, "Table 3.7 CT," not "Table 3.7 RME."

16. APPENDIX H, TABLE 5.1 - The oral Reference Dose (RfD) for TCE is 3E-04 mg/kg/d, not 6E-03 mg/kg/d.

17. APPENDIX H, TABLE 5.2 - The inhalation RfD for TCE is 1E-02 mg/kg/d.

If you have any questions concerning any of these comments, please call me (215) 814-5129.

Sincerely,

Mary Cooke

Mary T. Cooke
Remedial Project Manager

cc: Lora Fly, CNRMA
Paul E. Herman, VDEQ
Donna Caldwell, CH2M HILL